Class: Biology

Unit: The Cell

Topic: Mitosis: Me, Myself, and I

**CONTEXT OF LESSON:**

**Summary:** This lesson is to introduce the stages of mitosis its function. It will go over each stage and explain the processes which t5he cell is undergoing in each one. The students have already been introduced to the organelles of the cell and there functions.

**Day 1:**  The lesson will start off with a class discussion about what a cell might need to divide, (more DNA, 2 or each organelle, energy, etc). These ideas will be listed on the board. The terms mitosis and cytokinesis will then be placed on the board and broadly defined. I will then break the class into groups and pass out a worksheet containing diagrams of the stages of mitosis. In groups the students will be instructed to examine the diagrams and write down what they think is happening to the cell in each diagram. As they work on their worksheet, I will walk around and have one member from each group pick a piece of paper from a hat. This paper will indicate the type of project their group will have to create, (mitosis song, rap, diagram, play, skit, picture book, etc), they will then receive the coinciding instruction sheet for their project. After they have completed the worksheet I will start the power point presentation at the same time going over the worksheet asking the groups to say what they inferred from the diagram and why and then reviewing the stage and adding additional information. I will show them a mnemonic I came up with for the stages using (I P M A T C: I Pat My Arm To stay Calm). Their homework will be to come up with their own and to draw a representative picture of it. They will then have the rest of the class to discuss in their groups the projects.

**Day 2** We will review the homework and I will ask if they have any questions. I will start off be reviewing briefly what was discussed in the previous class and then move on. I will display some slides and ask who can identify what phases the cell is in and why. We will continues this type of review using their mnemonics and reiterating what characteristics the cell is showing that will help indicate the phase it is in, and also what occurs in the identified phase. After this they will be allowed to use the rest of class to finish their projects. Homework will be to work on project.

**Day 3:**  The first 5-10 min will be used for the groups to finish getting ready/set up their projects. The rest of class will be group presentations. Homework will be to draw the phases of mitosis and explain what is occurring during each phase.

**Context:** This is the 11th lesson in the Cell unit. The cells organelles and there function were introduced in previous lessons, along with its life cycle.

**Timing:** This lesson is designed for 3, 45min classes, with related homework.

**INSTRUCTIONAL OBJECTIVES: Students will be able to…**

* List and describe the different stages of mitosis.
* Explain what mitosis is and what it produces
* Describe the difference between mitosis in plant and animal cells.

**Learning Standards:**

**LS1 - All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).**

***LS1 (9-11) INQ+SAE+FAF -1***

*Use data and observation to make connections between, to explain, or to justify how specific cell organelles produce/regulate what the cell needs or what a unicellular or multi-cellular organism needs for survival (e.g., protein synthesis, DNA replication, nerve cells).*

**LS1 (9-11)-1 Students demonstrate understanding of structure and function-survival requirements by**…

**1a** explaining the relationships between and amongst the specialized structures of the cell and their functions (e.g. transport of materials, energy transfer, protein building, waste disposal, information feedback, and even movement).

**Teaching Standards:**

RIBTS **Standard # 2:** Teachers create learning experiences that reflect an understanding of central concepts, structures, and tools of inquiry of the disciplines they teach

* **2.3** select instructional materials and resources based on their comprehensiveness, accuracy, and usefulness for representing particular ideas and concepts.

RIBTS **Standard # 4**: Teachers create instructional opportunities that reflect a respect for the diversity of learners and an understanding of how students differ in their approaches to learning.

* **4.2** use their understanding of students (e.g., individual interests, prior learning, cultural experiences) to create connections between the subject matter and student experiences.

RIBTS **Standard #5:** Teachers create instructional opportunities to encourage students’ development of critical thinking, problem solving, and performance skills.

* **5.5** use tasks that engage students in exploration, discovery, and hands-on activities

RIBTS: **Standard # 6:** Teachers create a learning environment that encourages appropriate standards of behavior, positive social interaction, active engagement in learning, and self-motivation.

* **6.3:** Organize and allocate the resources of materials and physical space to support active engagement of students.
* **6.4:** Provide and structure the time necessary to explore important concepts and ideas.

RIBTS: **Standard # 8**: Teachers use effective communication as the vehicle through which students explore, conjecture, discuss, and investigate new ideas.

* **8.1:** Use a variety of communication strategies (e.g., restating ideas, questioning, offering counter examples) to engage students in learning.
* **8.4:** Emphasize oral and written communication through the instructional use of

discussion, listening and responding to the ideas of others, and group interaction.

**MATERIALS:**

**Day 1:**

* Mitosis worksheet
* Mitosis power point
* Different activity labels
* Computer
* Projector

**Day 2:**

* Slides of cells in mitosis
* Computer
* Projector

**Day 3**

* Anything that will be needed for presentations (tape recorder, computer, etc).

**ASSESSMENT:**

This lesson has a number of both formal and informal assessments. The discussion and worksheet on day one is used to assess the prior knowledge the students might have regarding what the cell needs to divide and any knowledge they might have on mitosis or cytokinesis. The slide show on day two will allow me to see which students are comfortable and which students are not and will allow me to review important concepts. The project will allow the students a way to creatively demonstrate what they have learned and allowing them to work together will help students reinforce concepts to each other. The final homework sheet will again reinforce the phases and their function but also allow me to compare them with the first diagram worksheet and see exactly what was learned.